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| 10/522,715 | 01/28/2005 | Karl Haberle | 264519US0PCT | 7463 |
| 22850 | 7590 | 03/21/2008 | | |
| OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314 | | | | |
| EXAMINER | | | | |
| NILAND, PATRICK DENNIS | | | | |
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| 1796 | | | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com

oblonpat@oblon.com

jgardner@oblon.com

Office Action Summary

Application No.

10/522,715

Applicant(s)

HABERLE ET AL.

Examiner

Patrick D. Niland

Art Unit

1796

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 October 2007 and 01 February 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 5-15 and 22-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 5-15 and 22-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB08)
- Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/30/07 and 2/1/08 has been entered.

The amendment of 10/30/08 has been entered. Claims 1, 5-15, and 22-24 are pending.

2. Claim 24 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

A. There is not basis in the originally filed specification for the newly presented limitations of claim 24. The examples pointed to by the applicant to support this claim are noted. However, these examples are merely small points in the broad range of invention encompassed by claim 24 which do not support the full scope of claim 24. The newly presented scope is new matter.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 5-15, and 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Pat. No. 4663377 Hombach et al. in view of US Pat. No. 6426414 Laas et al. and US Pat.

No. 4687813 Lenz et al. and further with Odian, George, Principles of Polymerization, Third Edition, 1991, pages 29-33 cited as further evidence.

Hombach discloses a water dispersible isocyanate composition containing aliphatic polyisocyanate of which only a few isocyanates are disclosed and these include isocyanurate of IPDI (column 2, lines 32-44), noting "or" and an emulsifier which is a polyisocyanate reacted with alkylene oxide in which the polyisocyanate can be one that is different from the polyisocyanate (a) (column 4, lines 6-68, particularly 6-11, particularly noting the general use of polyisocyanates which does not require the polyisocyanate to be polyisocyanate (a) and "Polyisocyanates suitable for the production of the emulsifiers include, in addition to the already above-mentioned polyisocyanates, other aliphatic diisocyanates." which shows that the emulsifier can use a different polyisocyanate than polyisocyanate (a) and that it can be one of the previously mentioned isocyanates. The previously mentioned polyisocyanates are few and one is isocyanurate of hexamethylene diisocyanate (column 2, lines 37-42) and biurets of HMDI (column 3, lines 28-36). It is noted that hexamethylene diisocyanates are most frequently listed of the isocyanates. The patentee does not specify the instantly claimed combinations of ingredients but generally encompasses them.

The instantly claimed emulsifiers are encompassed by column 4, lines 6-68, particularly 6-11, 18-29, 37-45, and 45-58, particularly noting the method in which the emulsifier is produced in a separate step. The resultant compound falls within the scope of the instantly claimed component C. Column 4, lines 12-14 meets the instant claim 5 and lines 17-23 meet the instant claim 6. Column 5, lines 7-12 falls within the scope of the instant claim 8. Column 5, lines 60 et seq. falls within the scope of the instant claims 9-10. The compositions of the reference are coated onto

substrates when used to adhere them to other substrates (abstract and throughout document including column 6, lines 30-35 which falls within the scope of the substrates of the instant claim 12) which falls within the scope of the instant claims 11-15. Solvent is not required as evidenced by "can be added" of column 5, lines 7-12 which indicates solvent to be optional.

It would have at least been obvious to one of ordinary skill in the art at the time of the instantly claimed invention to use the above discussed combinations of ingredients in the compositions of Hombach because they are encompassed by Hombach, would have been expected to give the properties described by Hombach, the use of the isocyanurate of isophorone diisocyanate is expected to give hard, fast curing polyurethanes as known by the ordinary skilled artisan and discussed by Lenz, column 4, lines 28-40 and 41-50 and this improved hardness, curing rate, and other improved properties resulting from using isocyanurate of IPDI as the curing agent would have been expected where the curing isocyanate is the isocyanurate of IPDI preferred by Hombach and isocyanurate or biuret of hexamethylene diisocyanate is used to make the emulsifier of Hombach as this is the other predominantly mentioned polyisocyanate of the patentee and its properties would have been expected in the final composition, including those improved properties mentioned by Hombach. Thus, improved hardness and curing rate are expected where isocyanurate of IPDI is used as the curing agent since this property is known for isocyanurate of IPDI.

It would have been obvious to one of ordinary skill in the art at the time of the instant invention to use the solvents of the instant claims, including claim 7, because they are known solvents for urethanes as taught by Laas, paragraph bridging columns 6-7, and are encompassed by column 5, lines 7-10 of Hombach. "Such as" is not limiting.

It would have been obvious to one of ordinary skill in the art at the time of the instant invention to use no solvent, i.e. the instant claim 23, because solvent is not required by Hombach by "can be added" of column 5, lines 7-12 which indicates solvent to be optional.

There is no showing of unexpected results commensurate in scope with the prior art and the instant claims, particularly regarding amounts, molecular weights, ratios of ingredients, and the other parameters which materially affect the properties of such compositions which are not addressed by the claims, examples, nor the prior art. The application examples and comparison examples are noted. The absences of isocyanurate if IPDI is addressed above. Comparison of examples 1 and 2 would be useful. However, these examples use different molecular weight polyethylene oxides than the examples, which alone will materially affect the properties. Thus, this comparison is not useful to the examiner. The same issues are present in examples 3 and 4. No comparison with the mixtures of isocyanurates of HMDI and IPDI in situ emulsified with the ethylene oxides of Hombach, which the examiner considers the closest prior art in view of the previous anticipation rejection on this issue, is seen. The applicant's examples are deficient from this perspective also.

The applicant's declaration of 2/1/08 (hereafter "the Haeberle declaration" is noted. Firstly the examiner continues to stand by the statement in the last interview that he will allow the claims where the examples previously discussed both use the same molecular weight polyethylene oxide chains and make the same property showing. It was mistakenly assumed that, at this level of skill in the art, it was understood that no other composition feature could be changed. The examiner firstly notes that the declarant uses the same "amount by weight of the PEO 500" as "was used as the amount of PEO 1000 used in Example 2" of the instant

application. See paragraph 4 of the Haeberle declaration. The examiner notes that given the halving of molecular weight, there is therefore a corresponding doubling of moles of PEO 500 verses the moles of PEO 1000 previously used in application example 2. The difference in the moles used of paragraph 6 of 0.013 moles of PEO 500 verses 0.007 moles PEO 1000 of example 2, page 18, line 21 of the instant specification compared to the calculated molar ratio of PEO 500:PEO 1000 of 2:1 indicated by the molecular weights 500 and 1000 is assumed to be due to round up error.

In any event, the use of twice as many moles of PEO 500 as compared to the moles used of PEO 1000 in example 2 of the instant specification would be understood by a general chemistry student to give a different composition than that of example 2 of the instant specification in that more NCO groups would be consumed minimally and possibly there would remain excess unreacted PEO 500 which could act as plasticizer or otherwise bring down the average molecular weight of the composition and thereby materially affect its modulus to which hardness is intimately related (well known and usually depicted in basic polymer textbooks). The declarant's example is not the same as example 2 except for the use of PEO 500 rather than PEO 1000 for this reason. The comparison is therefore not valid and the results are not unexpected given the differences between declaration example and example 2 of the application. The examiner cannot determine the affect this difference has on the comparison but expects this different amount of moles of PEO 500 to materially affect the properties of the declaration example so as not to be a valid comparison. "Unexpected results" are therefore not probatively shown in a manner commensurate in scope with the cited prior art and the instant claims. The declaration showing is not persuasive on this issue therefore.

Paragraph 9 states “in my opinion”. Opinion is not probative evidence and is therefore not persuasive.

Applicant’s arguments regarding Ex parte Humber, Bruderlein, and Asselin have been fully considered. It is expected that the reference to “improved results” is intended to be “unexpectedly improved results” or “unexpected results” as is axiomatic to the patent law and supported at page 3, lines 9-13 of the supplied copy of the decision which uses the phrase “unexpectedly significant improved results”.

The examiner notes that there is no assumption that a reaction in general is well known in the instantly cited prior art nor an assumption in this polyurethane art that any of the differences of the reactions of the cited prior art are expected to be inconsequential and of no significance. There is no contraindication in any of the prior art cited by the examiner against doing the things argued in the above rejection by the examiner. The examiner makes no assertions that any of the variations in the reactions disclosed by the cited prior art are expected to give the same results nor that the different modes of the cited prior art are expected to be equivalents. As noted above, even a molar change in one component is expected to give a difference. The examiner does not see that the applicant's proposed showings are in fact a showing of unexpectedly improved results for the claimed invention over the cited prior art and does not agree that the applicant’s showings “are even closer related than those of the prior art relied upon by the Examiner in order to rebut the prima facie case” to the instantly claimed invention than are the above cited teachings of the cited prior art.

The examiner notes Odian, page 32 “The rigidity of polymer chains is especially high when there are cyclic structures in the main polymer chains.” This high rigidity and high Tg and Tm

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are indicative of increased hardness which is expected to increase with increasing concentration of cyclic structure per polymer molecule. This is why diamond and Bakelite (R) are so hard. Thus, with increasing concentration of cyclic structure in the final cured product, which is obviously increased by the molecular weight of the polyether chains attached to the HDI isocyanurate being smaller per the entire isocyanate composition as well as when the isophorone diisocyanate isocyanurate, the greater cyclic contributing moiety, has no linear chains attached such as the emulsifier, the final cured product with the above discussed isocyanate composition is expected to give harder final polymers in view of the teachings of Odian discussed above. Thus, the applicant's showing is not unexpected even if it were a closer comparison to the instantly claimed invention than the compositions taught by the cited prior art. Higher initial and ultimate hardnesses are expected where the concentration of cyclic structure per molecule is maximized, as taught by Odian.

The applicant's arguments regarding making the emulsifiers b of Hombach via in situ methods are noted. See column 4, lines 49 et seq. However, Hombach is not limited to this teaching. The examiner points out column 4, lines 6-11, particularly "Polyisocyanates suitable for the production of the emulsifiers include, in addition to the already above-mentioned polyisocyanates" coupled with column 4, lines 45-49 "The emulsifiers can either be produced in a separate step by reaction of the named starting materials and then mixed with the polyisocyanate to be converted into an emulsifiable form", which encompasses the instantly claimed invention broadly. Thus, it is not seen that the applicant's argued showings are closer to the instantly claimed inventions than the cited prior art. It would have been obvious to one of ordinary skill in the art to use the instantly claimed combinations of isocyanates from the

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disclosure of Hombach, as cited above, including column 4, lines 6-11 and 45-49, because these sections of Hombach encompass the instantly claimed inventions and the above cited rationale to use mixtures of isocyanurate of HDI and isocyanurate of IPDI coupled further with Odian's teachings regarding cyclic structures increasing hardness lead the ordinary skilled artisan to expect that the instantly claimed invention would maximize both cure product hardness and emulsifiability of the isocyanate compositions. The applicant's results are therefore not unexpected. This encompasses the parameters of newly presented claim 24 for the above stated reasons, particularly those regarding Odian's teachings. The applicant's arguments have been fully considered but are not persuasive for the reasons stated above and the teachings of the cited prior art. This rejection is therefore maintained.

5. Claims 1, 5-6, 8-15, and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Pat. No. 4663377 Hombach et al. in view of US Pat. No. 6472493 Huynh-Ba and further with Odian, George, Principles of Polymerization, Third Edition, 1991, pages 29-33 cited as further evidence.

Hombach discloses a water dispersible isocyanate composition containing aliphatic polyisocyanate of which only a few isocyanates are disclosed and these include isocyanurate of IPDI (column 2, lines 32-44), noting "or" and an emulsifier which is a polyisocyanate reacted with alkylene oxide in which the polyisocyanate can be one that is different from the polyisocyanate (a) (column 4, lines 6-68, particularly 6-11, particularly noting the general use of polyisocyanates which does not require the polyisocyanate to be polyisocyanate (a) and "Polyisocyanates suitable for the production of the emulsifiers include, in addition to the already above-mentioned polyisocyanates, other aliphatic diisocyanates." which shows that the

emulsifier can use a different polyisocyanate than polyisocyanate (a) and that it can be one of the previously mentioned isocyanates. The previously mentioned polyisocyanates are few and one is isocyanurate of hexamethylene diisocyanate (column 2, lines 37-42) and biurets of HMDI (column 3, lines 28-36). It is noted that hexamethylene diisocyanates are most frequently listed of the isocyanates. The patentee does not specify the instantly claimed combinations of ingredients but generally encompasses them.

The instantly claimed emulsifiers are encompassed by column 4, lines 6-68, particularly 6-11, 18-29, 37-45, and 45-58, particularly noting the method in which the emulsifier is produced in a separate step. The resultant compound falls within the scope of the instantly claimed component C. Column 4, lines 12-14 meets the instant claim 5 and lines 17-23 meet the instant claim 6. Column 5, lines 7-12 falls within the scope of the instant claim 8. Column 5, lines 60 et seq. falls within the scope of the instant claims 9-10. The compositions of the reference are coated onto substrates when used to adhere them to other substrates (abstract and throughout document including column 6, lines 30-35 which falls within the scope of the substrates of the instant claim 12) which falls within the scope of the instant claims 11-15. Solvent is not required as evidenced by "can be added" of column 5, lines 7-12 which indicates solvent to be optional.

It would have at least been obvious to one of ordinary skill in the art at the time of the instantly claimed invention to use the above discussed combinations of ingredients in the compositions of Hombach because they are encompassed by Hombach, would have been expected to give the properties described by Hombach, the use of the isocyanurate of isophorone diisocyanate is expected to give hard, fast curing polyurethanes as known by the ordinary skilled artisan and discussed by Lenz, column 4, lines 28-40 and 41-50 and this improved hardness,

curing rate, and other improved properties resulting from using isocyanurate of IPDI as the curing agent would have been expected where the curing isocyanate is the isocyanurate of IPDI preferred by Hombach and isocyanurate or biuret of hexamethylene diisocyanate is used to make the emulsifier of Hombach as this is the other predominantly mentioned polyisocyanate of the patentee and its properties would have been expected in the final composition, including those improved properties mentioned by Hombach. Thus, improved hardness and curing rate are expected where isocyanurate of IPDI is used as the curing agent since this property is known for isocyanurate of IPDI.

It would have been obvious to one of ordinary skill in the art at the time of the instant invention to use no solvent, i.e. the instant claim 23, because solvent is not required by Hombach by "can be added" of column 5, lines 7-12 which indicates solvent to be optional.

There is no showing of unexpected results commensurate in scope with the prior art and the instant claims, particularly regarding amounts, molecular weights, ratios of ingredients, and the other parameters which materially affect the properties of such compositions which are not addressed by the claims, examples, nor the prior art. The application examples and comparison examples are noted. The absences of isocyanurate if IPDI is addressed above. Comparison of examples 1 and 2 would be useful. However, these examples use different molecular weight polyethylene oxides than the examples, which alone will materially affect the properties. Thus, this comparison is not useful to the examiner. The same issues are present in examples 3 and 4. No comparison with the mixtures of isocyanurates of HMDI and IPDI in situ emulsified with the ethylene oxides of Hombach, which the examiner considers the closest prior art in view of the

previous anticipation rejection on this is seen. The applicant's examples are deficient from this perspective also.

It would have been obvious to one of ordinary skill in the art at the time of the instant invention to use the combinations of HDI and IPDI trimers of Huynh-Ba and the amounts thereof which fall within the scope of the instantly claimed amounts of these compounds of the instant claim 22 to obtain the balance of hardness and curing speed taught by Huynh-Ba and Lenz and to use the amount of emulsifier falling within the scope of the instant claim 22 and Hombach (column 4, lines 5-44) that fall within the scope of the amounts of the instant claim 22 to make the aqueous dispersions of Hombach because Hombach broadly encompasses such compositions, they would have been expected to have the hardness/curing rate of Huynh-Ba and Lenz, and the benefits of aqueous compositions such as avoidance of harmful, EPA regulated, expensive organic solvents, and the emulsification taught by the compounds of column 4 of Hombach would have been expected in the compositions.

The applicant's declaration of 2/1/08 (hereafter "the Haeberle declaration" is noted. Firstly the examiner continues to stand by the statement in the last interview that he will allow the claims where the examples previously discussed both use the same molecular weight polyethylene oxide chains and make the same property showing. It was mistakenly assumed that, at this level of skill in the art, it was understood that no other composition feature could be changed. The examiner firstly notes that the declarant uses the same "amount by weight of the PEO 500" as "was used as the amount of PEO 1000 used in Example 2" of the instant application. See paragraph 4 of the Haeberle declaration. The examiner notes that given the halving of molecular weight, there is therefore a corresponding doubling of moles of PEO 500

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verses the moles of PEO 1000 previously used in application example 2. The difference in the moles used of paragraph 6 of 0.013 moles of PEO 500 verses 0.007 moles PEO 1000 of example 2, page 18, line 21 of the instant specification compared to the calculated molar ratio of PEO 500:PEO 1000 of 2:1 indicated by the molecular weights 500 and 1000 is assumed to be due to round up error.

In any event, the use of twice as many moles of PEO 500 as compared to the moles used of PEO 1000 in example 2 of the instant specification would be understood by a general chemistry student to give a different composition than that of example 2 of the instant specification in that more NCO groups would be consumed minimally and possibly there would remain excess unreacted PEO 500 which could act as plasticizer or otherwise bring down the average molecular weight of the composition and thereby materially affect its modulus to which hardness is intimately related (well known and usually depicted in basic polymer textbooks). The declarant's example is not the same as example 2 except for the use of PEO 500 rather than PEO 1000 for this reason. The comparison is therefore not valid and the results are not unexpected given the differences between declaration example and example 2 of the application. The examiner cannot determine the affect this difference has on the comparison but expects this different amount of moles of PEO 500 to materially affect the properties of the declaration example so as not to be a valid comparison. "Unexpected results" are therefore not probatively shown in a manner commensurate in scope with the cited prior art and the instant claims. The declaration showing is not persuasive on this issue therefore.

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Thus, with increasing concentration of cyclic structure in the final cured product, which is obviously increased by the molecular weight of the polyether chains attached to the HDI isocyanurate being smaller per the entire isocyanate composition as well as when the isophorone diisocyanate isocyanurate, the greater cyclic contributing moiety, has no linear chains attached such as the emulsifier, the final cured product with the above discussed isocyanate composition is expected to give harder final polymers in view of the teachings of Odian discussed above. Thus, the applicant's showing is not unexpected even if it were a closer comparison to the instantly claimed invention than the compositions taught by the cited prior art. Higher initial and ultimate hardnesses are expected where the concentration of cyclic structure per molecule is maximized, as taught by Odian.

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use mixtures of isocyanurate of HDI and isocyanurate of IPDI coupled further with Odian's teachings regarding cyclic structures increasing hardness lead the ordinary skilled artisan to expect that the instantly claimed invention would maximize both cure product hardness and emulsifiability of the isocyanate compositions. The applicant's results are therefore not unexpected. This encompasses the parameters of newly presented claim 24 for the above stated reasons, particularly those regarding Odian's teachings. The applicant's arguments have been fully considered but are not persuasive for the reasons stated above and the teachings of the cited prior art. This rejection is therefore maintained.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick D. Niland whose telephone number is 571-272-1121. The examiner can normally be reached on Monday to Thursday from 10 to 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on 571-272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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/Patrick D Niland/
Primary Examiner
Art Unit 1796